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Current (2015.10 - ): Postdoc at Peking University (Dr. Bo LI's group)
Nov. 2017, join ENN S&T Co., Ltd. to develop new small fusion reactor (Email: xiehuasheng@enn.cn).

## Education

- **Ph.D.** Plasma Physics, 2015, Zhejiang University
  Thesis: *Numerical Simulations of Micro-turbulence in Tokamak Edge* (Advisor: Yong XIAO)
- **B.S.** Physics, 2010, Zhejiang University
  Thesis: *Study of ES1D Beam-Plasma Interactions* (Advisor: Prof. Liu CHEN)

## Research interests (up to now)

- Fundamental plasma theories (especially, space plasma, astrophysics)
- Algorithms for numerical solutions or simulations of linear and nonlinear plasma problems
- Tokamak physics (Alfvén waves/eigenmodes, ballooning mode, edge, ...)
- Dipole field (space and laboratory, see gkd)

## Publications

1. **H. S. Xie**, Generalized Plasma Dispersion Function: One-solve-all Treatment, Visualizations, and Application to Landau Damping, Physics of Plasmas, 2013, **20**, 092125. [13a]

2. **H. S. Xie**, Constant Residual Electrostatic Electron Plasma Mode in Vlasov-Ampere System, Physics of Plasmas, 2013, **20**, 112108. [13b]

3. **H. S. Xie**, PDRF: A General Dispersion Relation Solver for Magnetized Multi-fluid Plasma, Computer Physics Communications, 2014, **185**, 670 – 675. [14a]

4. W. Chen, Z. Qiu, X. T. Ding, **H. S. Xie**, L. M. Yu, X. Q. Ji, J. X. Li, Y. G. Li, J. Q. Dong, Z. B. Shi, Y. P. Zhang, J. Y. Cao, X. M. Song, S. D. Song, M. Xu, Q. W. Yang, Yi. Liu, L. W. Yan, X. R. Duan and HL-2A team, Observation and Theory of Nonlinear Mode Couplings between Shear Alfvén Wave and Magnetic Island in Tokamak Plasmas, EPL, 2014, **107**, 25001. [14b]

5. **H. S. Xie**, J. Zhu and Z. W. Ma, Darwin Model in Plasma Physics Revisited, Physica Scripta, 2014, **89**, 105602. [14c]

6. W. Chen, LiMin Yu, Yi. Liu, X.T. Ding, **H. S. Xie**, J. Zhu, L.M. Yu, X.Q. Ji, J.X. Li, Y.G. Li, D.L. Yu, Z.B. Shi, X.M. Song, J.Y. Cao, S.D. Song, Y.B. Dong, W.L. Zhong, M. Jiang, Z.Y. Cui, Y. Huang, Y. Zhou, J.Q. Dong, M. Xu, F. Xia, L.W. Yan, Q.W. Yang, X.R. Duan and the HL-2A Team, Destabilization of Reversed Shear Alfven Eigenmodes Driven by Energetic Ions During NBI in HL-2A Plasmas with $q_{\min} \sim 1$, Nuclear Fusion, 2014, **54**, 104002. [14d]

7. **H. S. Xie** and Y. Xiao, Parallel Equilibrium Current Effect on Existence of Reversed Shear Alfvén Eigenmodes, Physics of Plasmas, 2015, **22**, 022518. [15a]

8. **H. S. Xie** and Y. Xiao, Unconventional Ballooning Structures for Toroidal Drift Waves, Physics of Plasmas, 2015, **22**, 090703. [15b]

9. **H. S. Xie** and Y. Xiao, PDRK: A General Kinetic Dispersion Relation Solver for Magnetized Plasma, Plasma Science and Technology, 2016, **18**, 97. [16a]

10. W. Chen, L. M. Yu, X. T. Ding, **H. S. Xie**, Z. B. Shi, X. Q. Ji, D. L. Yu, Y. P. Zhang, P. W. Shi, Y. G. Li, B. B. Feng, M. Jiang, W. L. Zhong, J. Y. Cao, X. M. Song, M. Xu, Y. H. Xu, L. W. Yan, Yi. Liu, Q. W. Yang, X. R. Duan and HL-2A Team, Core-localized Alfvénic Modes Driven by Energetic-ions in the HL-2A NBI Plasmas with Weak Magnetic Shears, Nuclear Fusion, 2016, **56**, 036018. [16b]

11. **H. S. Xie** and B. Li, Global Theory to Understand Toroidal Drift Waves in Steep Gradient, Physics of Plasmas, 2016, **23**, 082513. [16c]

12. **H. S. Xie**, Y. Xiao, I. Holod, Z. Lin and E. Belli, Sensitivity of kinetic ballooning mode instability to tokamak equilibrium implementations, Journal of Plasma Physics, 2016, **82**, 905820503. [16d]

13. J. Cheng, J. Q. Dong, L. W. Yan, Z. X. He, **H. S. Xie**, Y. Xiao, K. J. Zhao, Z. H. Huang, J. Q. Xu, L. Liu, Z. B. Shi, W. L. Zhong, D. L. Yu, X. Q. Ji, Y. Huang, X. M. Song, Q. W. Yang, X. T. Ding, X. L. Zou, X. R. Duan and HL-2A Team, Roles of turbulence − and pressure-gradient − induced flows in triggering H-mode at marginal heating power on HL-2A tokamak, EPL, 2016, **116**, 15001. [16e]

14. **H. S. Xie**, Y. Xiao and Z. Lin, New Paradigm for Turbulent Transport Across a Steep Gradient in Toroidal Plasmas, Physical Review Letters, 2017, **118**, 095001. [17a]

15. **H. S. Xie**, Y. Y. Li, Z. X. Lu, W. K. Ou and B. Li, Comparisons and applications of four independent numerical approaches for linear gyrokinetic drift modes, Physics of Plasmas, 2017, **24**, 072106. [17b]

16. **H. S. Xie**, Y. Zhang, Z. C. Huang, W. K. Ou and B. Li, Local gyrokinetic study of electrostatic microinstabilities in dipole plasmas, Physics of Plasmas, 2017, **24**, 122115. [17c]

## Submitted or to submit

1. **H. S. Xie**, Y. Xiao, Z. Lin and D. F. Kong, Gyrokinetic Simulations of the HL-2A Tokamak H-mode Edge Turbulence. I. Electrostatic Physics, to submit. [p15f]

2. **H. S. Xie**, Z. X. Lu and B. Li, Kinetic Ballooning Mode Under Steep Gradient: High Order Eigenstates and Relevance to Microtearing Mode, submitted, arxiv:1708.06570. [p17d]

## Books/Notes

1. **H. S. Xie**, Computational Plasma Physics - Introduction (in Chinese), Science Press, 2018, in press, http://hsxie.me/cppbook/. (计算等离子体物理导论，科学出版社，2018)

## Conference contributions

1. **H. S. Xie** and Y. Xiao, Essential Tokamak Geometric Effects for Global Ballooning Mode Study, poster, 23rd ICNSP Conference, Beijing, Sep. 14-16, 2013. Also, 55th Annual Meeting of the APS Division of Plasma Physics, Nov. 11-15, 2013, Denver, Colorado, USA.

2. **H. S. Xie** and Y. Xiao, Gyrokinetic Simulation of HL-2A H-mode Turbulent Transports, poster, 56th Annual Meeting of the APS Division of Plasma Physics, Oct. 27-30, 2014, New Orleans, Louisiana, USA.

3. J. Q. Dong, J. Cheng, L. W. Yan, Z. X. He, K. Itoh, **H. S. Xie**, Y. Xiao, K. J. Zhao, W. Y. Hong, Z. H. Huang, L. Nie, S.-I. Itoh, W. L. Zhong, D. L. Yu, X. Q. Ji,Y. Huang, X. M. Song, Q. W. Yang, X. T. Ding, X. L. Zou, X. R. Duan, Yong Liu and HL-2A Team, Mechanism of Low-intermediate-high Confinement Transitions in Tokamaks, IAEA, 2014.

4. **H. S. Xie** and Y. Xiao, Non-conventional Ballooning Structures for Linear Drift Wave Eigenmode in the Pedestal, poster, International Sherwood Fusion Theory Conference, Mar. 16-18, 2015, New York, USA.

5. **H. S. Xie**, Y. Xiao and Z. Lin, Reverse Trend of Turbulent Transport in Strong Gradient Fusion Plasmas, invited oral, 9th West Lake International Symposium on Plasma Simulation, May. 18-21, 2015, Hangzhou, China.

## Preprint or unrefereed

1. **H. S. Xie**, Pure Monte Carlo Method: a Third Way for Plasma Simulation, arXiv, 1210.2265.

2. **H. S. Xie** and L. Chen, Linear Gyrokinetic Coupling of Firehose and Mirror Modes, arXiv, 1210.4441.

(Selected manuscripts, which are not in final forms.)

## Teaching

1. 2010.09 - 2011.04, Teaching Assistant, Zhejiang University
   Methods of Mathematical Physics (I)(II), for 2nd year undergraduate, major in physics.

2. 2011.02 - 2011.04 & 2012.02 - 2012.04, Teaching Assistant, Zhejiang University
   Introduction to Plasma Physics, for 3rd year undergraduate, major in physics.

## Codes development

1. GPDF, General Plasma Dispersion Function, 2013. Ref: [13a].

2. PDRF, Plasma Dispersion Relation Solver – Fluid version, 2013. Ref: [14a].

3. PDRK, Plasma Dispersion Relation Solver – Kinetic version, 2014. Ref: [16a].

4. AMC, Alfvén Mode Code, 2013. Ref: [15a].

5. MGK, Multi-approach GyroKinetic code (with Yue-yan LI and Zhi-xin LU), 2016. Ref: [17b].

(Other educational oriented codes: pic1d, vlasov1d, orbitm, mhd2d, transport1d, ...)

See lists: http://hsxie.me/codes/

## Others

- Main developer of the IFTS-ZJU new website 'ifts.zju.edu.cn' (2010).
- User of large scale codes GTC (2011 - 2015) and GeFi (2011).
- Main contributor (organizer/speaker) of the IFTS-ZJU Study Group.